

17P/287/29

563

Question Booklet No

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.

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Roll No.

(Write the digits in words)

2017

Serial No. of OMR Answer Sheet

Day and Date

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)

1. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope.*
3. A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.
6. No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and also Roll No. and OMR sheet No. on the Question Booklet.
7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
8. Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by ball-point pen as mentioned in the guidelines given on the first page of the Answer Sheet.
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero mark).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit only the OMR Answer Sheet at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

[उपर्युक्त निर्देश हिन्दी में अन्तिम आवरण-पृष्ठ पर दिये गए हैं]

Total No. of Printed Pages : 22

ROUGH WORK
रफ़ कार्य

No. of Questions/प्रश्नों की संख्या : 120

Time : 2 Hours]
समय : 2 घण्टे]

[Full Marks : 360
[पूर्णांक : 360

Note : (i) Attempt as many questions as you can. Each question carries 3 (Three) marks. **One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.**

अधिकाधिक प्रश्नों को हल करने का प्रयत्न करें। प्रत्येक प्रश्न 3 (तीन) अंक का है। प्रत्येक गलत उत्तर के लिए एक अंक काटा जायेगा। प्रत्येक अनुत्तरित प्रश्न का प्राप्तांक शून्य होगा।

(ii) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

यदि एकाधिक वैकल्पिक उत्तर सही उत्तर के निकट प्रतीत हों, तो निकटतम सही उत्तर दें।

1. Biotechnology is based on :

- (1) only microorganisms
- (2) only microorganisms and animal cells
- (3) only animal cells and plant cells
- (4) microorganisms, animal cells and plant cells

2. In general, gene expression is regulated at the level of:

- (1) transcription
- (2) translation
- (3) protein transport
- (4) RNA processing

3. In case of complementary gene interaction, the test-cross ratio is :

- (1) 1:1:1:1
- (2) 1:1
- (3) 3:1
- (4) 9:7

(1)

(Turn Over)

4. Pea rust is caused by :

- (1) *Fusarium oxysporum* (2) *Uromyces fabae*
(3) *Puccinia pisi* (4) *Erysiphe pisi*

5. Which of the following is a flowering parasite of crops ?

- (1) Orobanche (2) Ustilago (3) Parthenium (4) Chlorella

6. Meloidogyne is :

- (1) a fungus (2) a nematode
(3) a protozoan (4) an insect

7. Earthworms thrive well in :

- (1) acidic soils (2) saline soils and acidic soils
(3) alkaline soils (4) neutral soils

8. The Calvin cycle is related to :

- (1) respiration (2) photosynthesis
(3) photorespiration (4) lipid synthesis

9. Which of the following is responsible for permanent hardness of water ?

- (1) carbonates (2) nitrates
(3) sulphates

10. *Rhizobium* and *Pseudomonas* are :
- (1) chemoautotrophs (2) autotrophs
 (3) heterotrophs (4) photoautotrophs
11. Plant dry matter has the highest concentration of :
- (1) H (2) C (3) N (4) O
12. The essential elements involved in electron transfer belong to :
- (1) group II (2) group III (3) group I (4) group IV
13. In plants, apical dominance involves :
- (1) gibberellin (2) auxin (3) ABA (4) cytokinin
14. The water potential of pure water is :
- (1) zero (2) two (3) five (4) one
15. The osmotic potential values are :
- (1) always positive (2) mostly positive
 (3) always negative (4) mostly negative
16. In climacteric fruits, the beginning of climacteric is associated with a sharp increase in the production of:
- (1) gibberellin ~~(2) auxin~~ (3) ~~(3)~~ (4) ethylene
- (Turn Over)

17. The 'bud chip' method is related to :

- (1) planting of sugarcane (2) grafting in trees
(3) budding in trees (4) planting of potato

18. The predominant system of cropping in India is :

- (1) maize-wheat (2) rice-potato
(3) rice-wheat (4) soybean-wheat

19. *Striga* parasitises :

- (1) pigeonpea (2) pearl millet (3) tomato (4) chick-pea

20. *Phalaris minor* is a weed in :

- (1) wheat (2) pea (3) rice (4) groundnut

21. *Odotatermes obesus* is the scientific name for :

- (1) cockroach (2) cutworm (3) termite (4) budworm

22. Tree banding is relevant to :

- (1) stem borer (2) mango happer
(3) cutworm (4) mealy bug of mango

23. Sanjose scale infests :

- (1) pear (2) apple (3) mango (4) citrus

(4)

(Continued)

30. Column A lists plant species and column B lists the oil storage tissue. Match the two columns and find the correct option from those given below these columns.

Column A

- A. Castor
B. Oilpalm
C. Soybean

Column B

- I. Cotyledon
II. Mesocarp
III. Endosperm

Options :

(1) A I B II C III

(2) A III B II C I

(3) A II B III C I

(4) A III B I C II

31. Which of the following organisms causes the greatest damage to crop plants ?

(1) Viruses

(2) Bacteria

(3) Fungi

(4) Nematodes

32. The greatest amount of insecticides is used in :

(1) wheat

(2) tomato

(3) sugarcane

(4) cotton

33. Pro-vitamin A is :

(1) β -carotene(2) α -tocopherol

(3) Lycopene

(4) Xanthophyll

34. The number of amino acids considered essential for humans is :

(1) 4

(2) 10

(3) 8

(4) 12

35. Sulphur containing amino acids are deficient in :

(1) rice

(2) chickpea

(3) maize

(4) wheat

(6)

(Continued)

36. Cereal proteins are deficient in :
- (1) Lysine (2) methionine (3) leucine (4) valine
37. Oils become rancid due to :
- (1) palmitic acid (2) oleic acid
(3) erucic acid (4) linolenic acid
38. Biodegradable plastic is :
- (1) a bacterial product (2) a plant product
(3) an animal product (4) a petroleum product
39. Aphids do not :
- (1) reproduce asexually (2) attack cotton
(3) feed on tissues (4) transmit viruses
40. Stem rust of wheat is caused by :
- (1) *Puccinia recondita* (2) *Puccinia graminis*
(3) *Puccinia striiformis* (4) *Puccinia triticina*
41. Consumption of grains infected by which of the following may cause abortion ?
- (1) Bunt (2) Rust (3) Ergot (4) Smut

(7)

(Turn Over)

42. Eukaryotic chromatin is composed of :

- (1) DNA + RNA
- (2) RNA + proteins
- (3) DNA + proteins
- (4) DNA + proteins + RNA

43. The eukaryotic chromatin fiber has the diameter of :

- (1) 100 Å
- (2) 300 Å
- (3) 250 Å
- (4) 500 Å

44. The symbol n represents :

- (1) gametic chromosome complement
- (2) somatic chromosome complement
- (3) polyploid condition
- (4) genomic number

45. Lampbrush chromosomes are found in :

- (1) pollen mother cells
- (2) human sperm
- (3) ascospores
- (4) human oocytes

46. Somatic chromosome pairing occurs in :

- (1) Dipteran salivary glands
- (2) pollen grains
- (3) root hairs
- (4) trichomes

47. Heterosis is believed to involve :
- (1) overdominance only
 - (2) overdominance, dominance and epistasis
 - (3) dominance only
 - (4) overdominance and dominance only
48. Histones are a regular component of :
- (1) bacterial chromosomes
 - (2) bacteriophage chromosomes
 - (3) plastid chromosomes
 - (4) animal chromosome
49. The term 'inbred' is not related to :
- (1) maize
 - (2) rice
 - (3) pearl millet
 - (4) Brassicas
50. Each chromosome comprises a single chromatid during :
- (1) S phase
 - (2) G1 phase
 - (3) prophase
 - (4) G2 phase
51. The lowest magnitude of inbreeding depression is observed in :
- (1) often cross-pollinated crops
 - (2) clonal crops
 - (3) cross-pollinated crops
 - (4) self-pollinated crops

52. Hybrid varieties of which of the following crops were the first to be used for commercial cultivation ?

- (1) Pearl millet (2) Rice (3) Maize (4) Sorghum

53. The term 'recurrent parent' is related to :

- (1) backcross method (2) pedigree method
(3) bulk method (4) recurrent selection

54. The *opaque-2* gene of maize improves :

- (1) kernel appearance (2) protein content
(3) endosperm texture (4) protein quality

55. Breeder seed is progeny of :

- (1) truthful seed (2) certified seed
(3) nucleus seed (4) foundation seed

56. In eukaryotic chromosomes, highly repetitive DNA generally occurs in :

- (1) bands of giant chromosomes (2) telomeres and centromeres
(3) chromomeres (4) only centromeres

57. The Indian Institute of sugarcane research is located in :

- (1) Lucknow (2) Kanpur (3) Coimbatore (4) Shahjahanpur

58. Neurospora is :
- (1) a fungus (2) an animal
(3) a bacterium (4) an angiosperm
59. Rhizobium forms nodules in :
- (1) tomato (2) rice (3) finger millet (4) lentil
60. Bilirubin level in blood is elevated in :
- (1) hepatitis (2) gastritis (3) encephalitis (4) dengue
61. Atmospheric nitrogen is fixed by :
- (1) green algae (2) only blue-green algae
(3) bacteria and blue-green algae (4) only bacteria
62. The disease transmitted through water is :
- (1) hepatitis B (2) hepatitis A
(3) encephalitis (4) dengue
63. Orobanche attacks
- (1) flowers (2) leaves
(3) leaves and flowers (4) roots

64. The fatty acid with antinutritional effects is :

- (1) linolenic acid (2) erucic acid
(3) linoleic acid (4) oleic acid

65. Hypersensitive host response is typical of resistance to :

- (1) obligate parasites (2) facultative parasites
(3) facultative saprophytes (4) saprophytes

66. *Pythium* spp. cause :

- (1) leaf spot (2) rust (3) root rot (4) mildew

67. *Tilletia indica* causes :

- (1) Karnal bunt of wheat (2) partial bunt of rice
(3) loose smut of barley (4) loose smut of wheat

68. *Dysdercus cingulatus* generally attacks :

- (1) rice (2) sugarcane (3) groundnut (4) cotton

69. The favourite food of lady beetles is:

- (1) jassids (2) aphids (3) flies (4) mealy bugs

70. Nymphs are produced by :

- (1) Orthoptera (2) Diptera (3) Coleoptera (4) Lepidoptera

71. The term 'pureline' is related to :
- (1) maize (2) sugarcane (3) wheat (4) potato
72. When the F_1 from a cross is superior to the best varieties of the crop, the phenomenon is called :
- (1) economic heterosis (2) average heterosis
(3) balanced heterosis (4) heterobeltiosis
73. The mutagenic effects of ultra violet rays are due to :
- (1) DNA cross-linking (2) ionization
(3) chromosome breakage (4) thymine dimer formation
74. Heterochromatin stains deeply during :
- (1) anaphase (2) interphase (3) telophase (4) metaphase
75. Crossing over takes place during :
- (1) zygotene (2) leptotene (3) pachytene (4) diakinesis
76. Given below are the chief modes of inheritance :
- (I) Oligogenic (II) Polygenic (III) Cytoplasmic
- Pick the correct option for the known modes of inheritance for disease resistance in plants :
- (1) (I), (III) (2) (I), (II), (III) (3) (I), (III) (4) (I), (II)

77. The evolution of new genes involves :

- (1) duplication (2) deletion (3) translocation (4) inversion

78. Bt-cotton hybrids are :

- (1) virus resistant (2) disease resistant
(3) herbicide resistant (4) insect resistant

79. The first transgenic variety approved for commercial cultivation was improved for :

- (1) herbicide resistance (2) virus resistance
(3) a quality trait (4) drought resistance

80. Specific RNA molecules are detected by :

- (1) ELISA (2) Southern blotting
(3) Western blotting (4) Northern blotting

81. Antibodies are used in :

- (1) Southern hybridization (2) Western blotting
(3) Northern blotting (4) Colony hybridization

82. Transposable elements were first discovered in :

- (1) maize (2) *E. coli* (3) yeast (4) Arabidopsis

83. Southern hybridization does not use :

- (1) gel electrophoresis (2) restriction enzymes
(3) primers (4) probes

84. Hargovind Khorana is known for :

- (1) recombinant DNA
(2) chemical synthesis of a complete gene
(3) genetic transformation
(4) endonucleases

85. Consider the following components of genetic variance :

- (I) Additive (II) Dominance
(III) Additive \times additive (IV) Additive \times dominance

Selection in a crop like rice will be able to utilize :

- (1) (I) and (IV) (2) ~~(I) and (II)~~
(3) (I), (II) and (IV) (4) ~~(I) and (III)~~

86. The Indian Institute of Pulses Research is located in ;

- (1) New Delhi (2) Kanpur (3) Karnal (4) Varanasi

87. A human individual with three copies of chromosome 21 would show :

- (1) Turner's syndrome (2) Patau syndrome
(3) Down's syndrome (4) Klinefelter's syndrome

88. The 'grow-out' test for seed lots is a test for :

- (1) genetic purity (2) germination
(3) physical purity (4) presence of disease

89. The genetic consequence of asexual reproduction is :

- (1) increased heterozygosity (2) increased homozygosity
(3) no change in genotype (4) new genetic variation

90. Consider the following :

- (I) Rooting of shoots (II) Suspension culture (III) Somatic embryogenesis

Auxin is used for :

- (1) (I), (III) (2) (I), (II), (III)
(3) (I), (II) (4) (II), (III)

91. Micropropagation is a form of :

- (1) apomixis (2) sexual reproduction
(3) parthenocarpy (4) vegetative propagation

92. Consider the following techniques :

(I) Meristem culture (II) Embryo culture (III) Protoplast fusion

The techniques useful in interspecific hybridization are :

- (1) (II) and (III) (2) (I) and (II)
(3) (I) and (III) (4) (I), (II) and (III)

93. Consider the following :

(I) Pathogens (II) Insect pests (III) Weeds

'Quarantine' aims at minimizing the risk of entry into the country of new :

- (1) (I) and (II) (2) (II) and (III)
(3) (I) and (III) (4) (I), (II) and (III)

94. 'Disarming' of Ti plasmid refers to the deletion of :

- (1) T-DNA
(2) *vir* genes
(3) genes for auxin and cytokinin synthesis
(4) genes for opine synthesis

95. The enzyme reverse transcriptase is used for the construction of :

- (1) recombinant DNA (2) cDNA library
(3) genomic library (4) vectors

96. Consider the following organisms :

- (I) plants (II) *E. coli* (III) yeast

Plasmid is known to occur in :

- (1) (II), (III) (2) (I), (II), (III)
(3) (I), (III) (4) (I), (II)

97. Vernalization is related to :

- (1) drought tolerance (2) heat shock
(3) cryopreservation (4) cold treatment

98. The 'Dolly' sheep was a :

- (1) cloned animal (2) hybrid animal
(3) sexual progeny (4) transgenic animal

99. In plant cell walls, pectin is present in :

- (1) primary cell wall (2) plasma lemma
(3) middle lamella (4) secondary cell wall

100. In plants, plasma lemma is made up of :

- (1) lipids (2) proteins
(3) polysaccharides (4) lipids and proteins

101. Off-season nursery of wheat is grown at :

- (1) Cuttack (2) Wellington (3) Pusa (4) Srinagar

102. The 'green revolution' was initiated by semi-dwarf varieties of:

- (1) wheat (2) rice (3) maize (4) sorghum

103. In plants, sperms are produced by

- (1) meiosis in pollen grains
(2) mitosis in pollen grains
(3) meiosis in pollen mother cells
(4) mitosis in pollen mother cells

104. EEG monitors the activity of :

- (1) lungs (2) heart (3) brain (4) liver

105. 'Canola' quality oil has :

- (1) 'zero' glucosinolate and 'zero' erucic acid
(2) 'zero' glucosinolate only
(3) 'zero' erucic acid only
(4) 'zero' linolenic acid only

106. The spore associated with sexual reproduction is :

- (1) conidia (2) sporangiospore (3) pycniospore (4) ascospore

107. A ring of four chromosomes at the first metaphase of meiosis suggests :

- (1) deletion (2) inversion (3) translocation (4) duplication

108. A new species is produced by :

- (1) aneuploidy (2) translocation
(3) autopolyploidy (4) allopolyploidy

109. The spore produced at the tip of special branches is :

- (1) sporangiospores (2) conidia
(3) oidia (4) ascospores

110. Somaclonal variation is related to :

- (1) mutation (2) hybridization (3) heterosis (4) segregation

111. The bulk method of breeding can be used in :

- (1) a genetically variable pureline of wheat
(2) segregating generations of barley
(3) an open-pollinated variety of maize
(4) a multiline variety of wheat

112. Insect parasitoids belong to :

- (1) Coleoptera (2) Orthoptera (3) Lepidoptera (4) Hymenoptera

113. The biocontrol agent *Bacillus thuringiensis* is not effective against :

- (1) Lepidoptera (2) Coleoptera (3) Orthoptera (4) Diptera

114. Golgi bodies are concerned with :

- (1) packaging of molecules (2) cell division
(3) cell differentiation (4) storage

115. Grafting is generally used for vegetative propagation of :

- (1) date palm (2) mango (3) oil palm (4) citrus

116. tRNA participates in :

- (1) RNA processing (2) transcription
(3) RNA editing (4) translation

117. The radiation with the lowest penetration in biological tissues is :

- (1) gamma-rays (2) X-rays
(3) β -rays (4) ~~fast neutrons~~

(24)

(Turn Over)

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118. *Pyrilla* is a pest of :

- (1) sugarcane (2) cotton (3) cucurbits (4) rice

119. The $2n$ chromosome complement of barley has :

- (1) 7 chromosomes (2) 14 chromosomes
(3) 18 chromosomes (4) 20 chromosomes

120. The equipment particle gun is used for :

- (1) insect control (2) virus elimination
(3) somatic hybridization (4) genetic transformation

ROUGH WORK
रफ़ कार्य

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण-पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली या काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा, केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ. एम. आर. पत्र पर अनुक्रमांक संख्या, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक संख्या और ओ. एम. आर. पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिये आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिये केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ़ कार्य के लिये प्रश्न-पुस्तिका के मुखपृष्ठ के अन्दर वाले पृष्ठ तथा अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ. एम. आर. उत्तर-पत्र परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।